



भारतीय प्रौद्योगिकी संस्थान पटना
Indian Institute of Technology Patna

PROFESSIONAL CERTIFICATE PROGRAM IN

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING (AI & ML)

(BATCH: 01)



DIRECTOR'S MESSAGE

DEAR ASPIRING PROFESSIONALS

Welcome to the Professional Certificate Program in Artificial Intelligence & Machine Learning at the Indian Institute of Technology, Patna. As we stand at the forefront of the Fourth Industrial Revolution, the demand for expertise in AI and ML continues to grow exponentially across various sectors. This program is designed to equip you with the essential skills and knowledge required to thrive in this dynamic field.

At IIT Patna, we pride ourselves on our commitment to academic excellence and innovation. Our distinguished faculty, comprised of leading experts in AI and ML, will guide you through a rigorous curriculum that combines theoretical foundations with practical applications. You will engage in hands-on projects, collaborative learning, and real-world case studies, ensuring that you are well-prepared to tackle the challenges of tomorrow.

We believe that education is not just about imparting knowledge, but also about fostering critical thinking, creativity, and a passion for lifelong learning. By joining this program, you are taking an important step towards becoming a leader in technology and driving meaningful change in society.

I encourage you to make the most of this opportunity. Collaborate with your peers, ask questions, and immerse yourself in the learning experience. Together, let us explore the limitless possibilities of AI and ML.

Welcome aboard, and I wish you all the best on this exciting journey!

Warm Regards,

Director: T. N. Singh
Indian Institute of Technology, Patna

INDUSTRY OVERVIEW

The AI market is expected to grow at a compound annual growth rate (CAGR) of 38.1% between 2022 and 2030.

01

AI jobs are plentiful, with hiring growing by 32% in the last couple of years. However, there is a high talent gap.

02

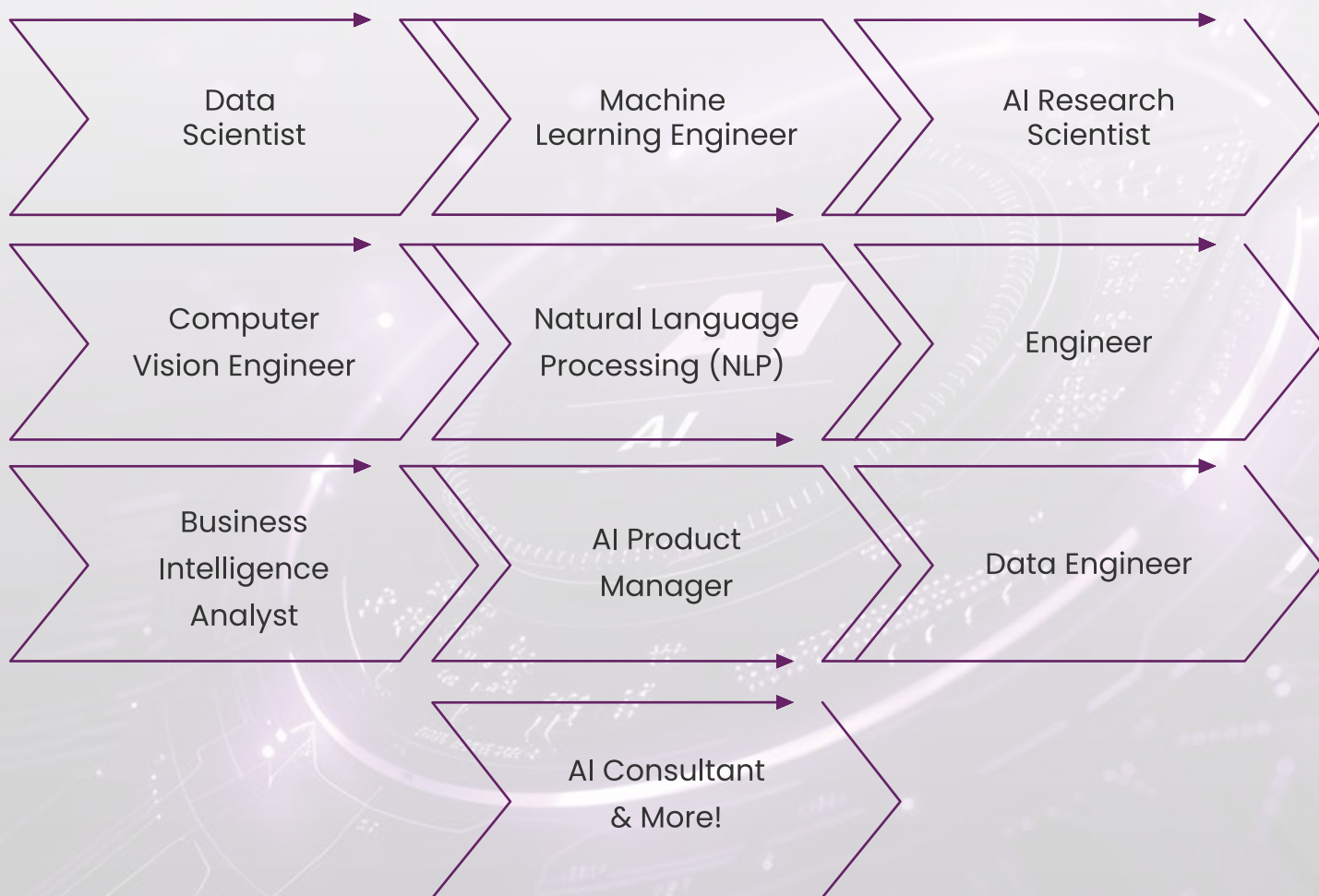
This advanced AI is expected to become the fastest-growing market segment between 2024 and 2030.

03

83% of companies say AI is a top priority in their business plans.

04

UNIQUE JOB ROLES



COURSE OBJECTIVE

The Professional Certification Program in Artificial Intelligence and Machine Learning from IIT Patna is designed to equip participants with cutting-edge knowledge and practical skills in Artificial Intelligence and Machine Learning. The program aims to:

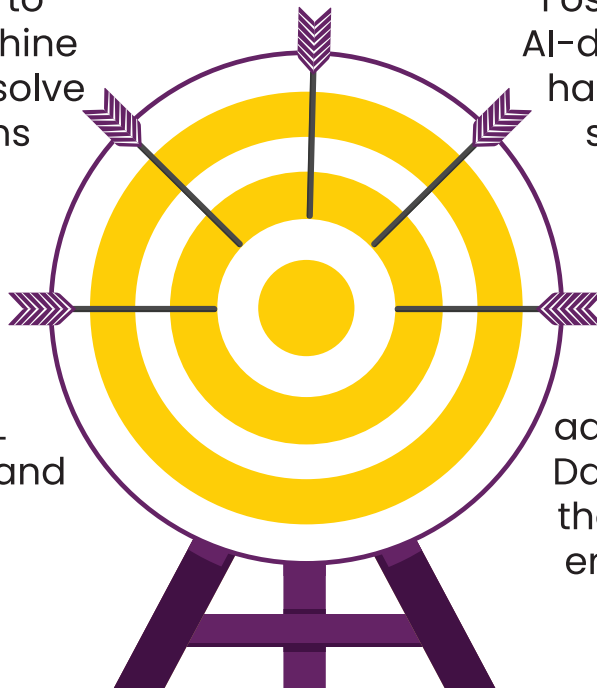
Develop proficiency in popular tools and programming languages like Python, TensorFlow, and PyTorch.

Enable participants to apply advanced Machine Learning methods to solve real-world problems across industries.

Foster critical thinking for AI-driven solutions through hands-on projects, case studies and industry applications.

Provide a solid foundation in AI/ML concepts, algorithms and techniques.

Prepare learners for advanced roles in AI and Data Science, enhancing their career prospects in emerging technologies.



LEARNING OUTCOMES

Upon successful completion of the Professional Certification program in Artificial Intelligence and Machine Learning from IIT Patna, the following are the expected learning outcomes:

- ① **Understand Core AI and Machine Learning Concepts:** Grasp foundational theories, algorithms, and techniques in AI/ML, and learn to apply these principles to various domains.
- ② **Develop Machine Learning Models:** Design and implement supervised, unsupervised, and reinforcement learning models using industry-standard tools like Python, TensorFlow, and PyTorch.
- ③ **Work With Real-World Datasets:** Apply data preprocessing, feature engineering, and model evaluation techniques to solve real-world problems across diverse industries.
- ④ **Implement Deep Learning Techniques:** Master neural networks, deep learning architectures, and advanced algorithms for tasks such as image recognition, natural language processing, and more.
- ⑤ **Apply AI/ML Solutions To Industry-Specific Challenges:** Utilize AI and ML tools for developing solutions in healthcare, finance, retail, and other sectors through hands-on projects and case studies.
- ⑥ **Evaluate And Optimize Model Performance:** Gain expertise in fine-tuning and optimising models for accuracy, precision, and scalability in real-world applications.
- ⑦ **Stay Updated With Emerging AI Trends:** Keep pace with the latest advancements in AI/ML, including ethical considerations, interpretability, and AI governance for responsible innovation



WORLD-CLASS EXPERIENCE

Transformative Experience: The course has significantly influenced students by bridging the gap between their previous education and the academic expectations at IIT.

Focused Learning Modules: The course provides targeted modules that deepen students' comprehension.

Personalised Mentorship: Students benefit from tailored guidance that enhances their confidence and learning experience.

Practical Projects: Hands-on projects are included to reinforce foundational knowledge.

Enhanced Academic Performance: The course effectively prepares students for the challenges at IIT, resulting in improved academic outcomes.

Easier Transition: Students find the transition into the IIT curriculum smoother and provide positive feedback about the course.



PROGRAM CURRICULUM

MODULE 1

Basic Statistical Learning for Analytics

Introduction to Data Modelling for Business
Fundamentals Of Statistics
Inferential Statistics
Descriptive Statistics with R
Concept and Application of Sampling Theory
Hypothesis and Testing with R
Multivariate Analysis with R
Principal Component Analysis and Linear Algebra

MODULE 3

Machine Learning: Concepts and Applications in Python

Idea of Supervised and Unsupervised Machine Learning
Simple & Multiple Linear Regression
Logistic Regression
Cross Validation and Hyperparameter Tuning
Decision Trees and Random Forest
Boosting Algorithms
Support Vector Machine
Neural Networks-Overview of ANN, CNN, RNN
Recommender System
Clustering (K-means and Hierarchical)

MODULE 2

Applied Descriptive Analytics and Data Visualization for Business

Data Analytics with Python
Python Libraries-NumPy, Pandas, Matplotlib, Scikit
Data Visualizations with Tableau

MODULE 4

Applied Descriptive Analytics and Data Visualization for Business

Unstructured Data collection and Web Scrapping
Concepts of Text Mining
Natural Language Processing
Document Classification and Clustering
Document Summarization
Sentiment Analysis (Aspect Extraction, Lexicon and Sent)

MODULE 5

Marketing Analytics

Introduction To Market Analytics
Concepts Of Customer Analytics
Building Predictive Models. Sales Prediction
And Price
Predictim
Customer Churn Problem
Customer Profitability And Customer Lifetime
Value

MODULE 6

Deep Learning Specialization

Introduction In Deep Learning
Artificial Neural Networks
Tensorflow
Model Optimization and Performance
Improvement
Transformer Models For Natural Language
Processing (NLP)
Convolutional Neural Networks (CNNs)
Object Detection
Deep Neural Networks
Transfer Learning
Getting Started With Autoencoders
Recurrent Neural Networks (RNN)

MODULE 7

Essentials of Generative AI, Prompt Engineering & ChatGPT

Introduction To Generative AI Models
Explainable AI
Prompt Engineering
ChatGPT
Deploying And Scaling ChatGPT
Ethical Considerations In Generative AI
Models
The Future Of Generative AI
Large Language Models
Fine-Tuning ChatGPT

MODULE 8

Advanced Generative AI

Introduction To Generative Models
Large Language Models Architecture
Types Of Generative AI Models
Attention Mechanisms And Transformers
Popular Generative AI Models
Benchmarking & Evaluating Models
Advanced Prompt Engineering Technology

MODULE 9

Big Data Analytics

Big Data Ecosystem
Big Data Strategy
ML Using Spark

MODULE 10

Artificial Intelligence at Production Level

ML Pipeline
Production Environment
Model Deployment
Microsoft Azure AI Fundamentals

— MASTER — INDUSTRY TOOLS



PROGRAM DETAILS

Eligibility (Admission Criteria)	<ul style="list-style-type: none">• Graduates (10+2+3) from a recognized university in any stream from any recognized University or Institution (Students Pursuing Graduation are also eligible)• Diploma Holders with at least 1 year of work experience.• (10+2/HSC) with at least 1 year of work experience.
Program Duration	6 Months
Mode of Instruction	Online
Class Timing	Every Sunday 09:00 AM to 12:15 PM
Campus Immersion	2 Days in 6 months

SKILLS GAINED THROUGH THE PROGRAM

Smart Contracts

Programming Languages



Blockchain Architecture

Data Structure



Cryptography

WHAT WILL YOU LEARN?



UNDERSTAND

The need for big data, challenges and different analytical architectures

LEARN

The history, types and applications of blockchain

ACQUIRE

Knowledge about cryptography and consensus algorithms

IDENTIFY

Network vulnerabilities and apply various security mechanisms

ANALYSE

Distributions and relationships of real-time data



(Disclaimer: The above certificate is only for reference purposes, the actual certificate from IIT Patna may differ.)

Policies for Refund of Fees

- 80%- Before the first day of instruction
- Nil- On/After the first day of instruction

PROGRAM FACULTIES



PROF. KULDEEP SINGH PATEL



PROF. SAMRAT MONDAL



PROF. ARIJIT MONDAL



PROF. SOURAV KUMAR DANDAPAT



PROF. JOYDEEP CHANDRA

PROGRAM FEES & INSTALLMENT SCHEDULE

TOTAL FEES

PARTICULARS	AMOUNT (IN INR)
APPLICATION FEE (AT THE TIME OF REGISTRATION)	2,500/-
TOTAL FEE (EXCLUDING APPLICATION FEE)	60,000/-

NOTE

- ✓ Collection of all the above fees will be done by IIT Patna
- ✓ In case the Applicant's profile is rejected by the Institute application charges of INR 2,500/- would be non-refundable

INSTALMENT

PARTICULARS	INSTALMENT I		INSTALMENT II
DATE	AT THE TIME OF REGISTRATION	WITHIN ONE WEEK OF OFFER ROLL OUT DATE	10 th APRIL 2025
AMOUNT (IN INR)	INR 2,500/-	INR 30,000/-	INR 30,000/-

PROGRAM TIMELINES

APPLICATION CLOSURE DATE	27 th JANUARY 2025
PROGRAM START DATE	09 th FEBRUARY 2025



THE IIT PATNA

ADVANTAGE

Founded in 2008, IIT Patna is India's newest and fastest-growing premier institution. The institute features ten departments: Computer Science & Engineering, Electrical Engineering, Mechanical Engineering, Chemical & Biochemical Engineering, Civil & Environmental Engineering, Materials Science & Engineering, Chemistry, Physics, Mathematics, and Humanities & Social Sciences. IIT Patna boasts modern facilities equipped with cutting-edge technology, including advanced software and machinery, used to train and educate students effectively. The institution has made significant contributions to high-quality, peer-reviewed national and international journals. Its faculty members possess diverse academic and research expertise, having trained at top-ranked institutions both domestically and internationally.

IIT Patna places a significant focus on entrepreneurship and innovation, fostering partnerships with industries and research organisations both in India and globally. The institute actively promotes start-ups and technological innovation through its incubation centre. It has a growing reputation for research in fields such as Artificial Intelligence, Robotics, and Renewable Energy.

Through its holistic education approach, IIT Patna aims to create well-rounded professionals who contribute to technological advancements and societal development, positioning itself as one of the top emerging IITs in India.

OVERVIEW OF

IIT PATNA

In Emerging Government
Colleges In A Best College
Ranking 2022 By India
Today-Mdra



RANKED 2nd

RANKED 9th

Best Government Engineering
College In The Performance
Category Overall



For Placement Records



RANKED 10th

2500+ ALUMNI



Serving National And
International Institutions At
Leadership Positions

M.tech Students



100+

10+



Operating Departments

Faculty Members



100+

ABOUT PW MEDHARTHI

PW Medharthi is dedicated to transforming the education landscape in India. Founded on the belief that quality affordable learning should be accessible to all, we leverage innovative technology and engaging content to create enriching educational experiences.

We at PW Medharthi understand the diverse needs of learners across the country.

Our comprehensive platform offers tailored solutions, from interactive courses to skill-building resources, designed to empower students, educators, and institutions alike. Focusing on academic excellence and personal growth, we collaborate with IITs & IIMs, as well as other premium institutes, to bridge the gap between traditional learning methods and the demands of a rapidly evolving digital world.

Join us on our mission to bridge the gap between theoretical knowledge and real-world application, inspire curiosity, foster creativity, and cultivate lifelong learners, as we reshape the future of education in India and beyond. Together, let's unlock the potential of every learner!



Enrolling in the Professional Certificate Program In Artificial Intelligence & Machine Learning (AI & ML) by the Indian Institute of Technology Patna, in partnership with Physics Wallah, offers an exceptional opportunity to delve into the cutting-edge world of AI and ML. Participants will gain a solid foundation in key concepts, algorithms, and tools, equipping them with the skills needed to excel in this rapidly evolving field. Join us to unlock your potential and shape the future with AI & ML!

MR. TANMOY DASGUPTA

SALES MANAGER



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Get Placement Support From PW



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